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Slow spread of Bovine Virus Diarrhea Virus in dairy cow herds is a challenge for surveillance after eradication

BÖTTCHER J.¹, TUROWSKI V. ¹, RUCKDESCHEL D. ¹, HOOPS M. ¹, HAGG M. ¹, LORENZ I. ¹, JANOWETZ B. ¹

¹ TGD Bayern e.V., Poing, Germany

INTRODUCTION

A mandatory Bovine Virus Diarrhea Virus (BVDV) control program started in Germany in January 2011. The program was based on ear-notch-testing of calves. A serological bulk-milk-surveillance of dairy cow herds is currently discussed. Regular prophylactical vaccination is not allowed anymore since May 2021. EU 2020/689 requires that surveillance has to detect a target seroprevalence of 50%. We assessed BVDV-seroprevalences in herds with recent BVDV-outbreaks.

MATERIALS AND METHODS

In 11 dairy cow farms (mean 39 cows) with BVDV-positive calves the history of ear-notch-testing since 2011 and the BVDV-vaccination history were assessed. The duration of an outbreak was expressed as 'PI-years', i.e. number of years from the first BVDV-positive calf until the first serological testing in this study. Two outbreaks were assumed to be independent if they were separated by >2 years without BVDV-positive calves; the most recent was used for classification of the herd.

'PI-year=1' was recorded in 7 herds; in two of these farms one additional PI-year had been observed 4 and 5 years earlier. Four herds were classified as 'PI-year>1', one herd with 2, 3, 4, and 5 PI-years, respectively.

Individual milk samples were tested with commercially available ELISAs (Idexx, IDVet, Svanova – monophasic). Seroprevalences (SP) were calculated and median SP (MSP) of herds were compared for 'PI-year=1' and 'PI-year>1'. Since 2018 three additional outbreak farms were serologically tested only with selected ELISAs and were vaccinated with an attenuated BVDV-vaccine based on genotype 1 and 2.

RESULTS

MSP in group 'PI-year=1' were 22.2%, 22.2% and 15.0% and in group 'PI-year>1' 82.0%, 56.6% and 59.8% for IDVet, Idexx and Svanova, respectively. In two herds only the mother of one BVDV-positive calf was antibody positive! One herd (PI-years=1) was epidemiologically linked to two other farms with 8 and 3 PI-years (both genotype 1f and 7 km distance to the study-farm).

Three additional herds (SP: IDVet 13.5% and 58.1%, Svanova 14.3%) were vaccinated. Notably, SP 13.5% was determined prior to vaccination after 3 BVDV-positive calves had been born 9 months apart. Only one positive calf was recorded 8 months after vaccination. In contrast, in an unvaccinated farm 'PI-year=1' two BVDV-positive calves had been detected two years later. One and even two years without BVDV-positive calves were observed in case of 3 and 2 outbreaks, respectively.

DISCUSSION AND CONCLUSIONS

MSP in herds 'PI-year=1' of about 20% indicated that the pre-scribed target seroprevalence of 50% is inappropriate for the surveillance of freedom; moreover, only 50% of herds exceeded 20%. Consequently, the sensitivity of antibody-ELISAs needs to be increased. Meanwhile, increased pool sizes (e.g. 100-200) of ear-notches are a compromise keeping costs and safety of surveillance in a balance. Transient infection spreads slowly within herds resulting in a prolonged duration of outbreaks, consequently, vaccination in case of BVDV-detection needs to be encountered as an emergency measure.

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